SONY

AC ADAPTOR

AC-DN1

MAINTENANCE MANUAL
1st Edition
Serial No. 10001 and Higher

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理など行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Manual Structure

Purpose of this manual

This manual is the maintenance manual for AC Adaptor AC-DN1.
This manual describes the information items on maintenance, and items that premise the service based on the components parts such as alignment, schematic diagram, board layout and spare parts list, assuming use of service engineers.

Contents

The following are summaries of the each section for understanding the manual.

Section 1. Service Overview
Describes information about connector input/output signals, recommended power cords, and replacement of part.

Section 2. Electrical Alignment
Describes electrical adjustment.

Section 3. Spare Parts
Describes parts list, exploded view, and supplied accessories used in the unit.

Section 4. Semiconductor Pin Assignments
Describes function diagrams and pin names of semiconductor used in the unit.

Section 5. Diagrams and Board Layout
Describes block diagram, schematic diagram and board layout.

Relative manual

Besides this maintenance manual, the following manual is available for this unit.

- **Operation Manual (Supplied with this unit)**
  This manual is necessary for application and operation of this unit.

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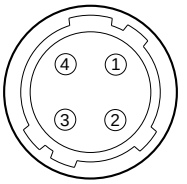
Section 1
Service Overview

1-1. Connector Input/Output Signals

AC IN

AC 100 V to 240 V, 45W

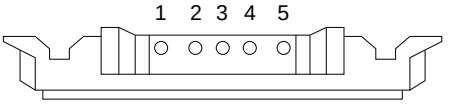
DC OUT (4P FEMALE)



(External view)

Pin No.	Signal	Specifications
1	DC OUT	+16.6 to +17.0 V, 2.2 A max
2	DC OUT	
3	GND	GND for DC OUT
4	GND	

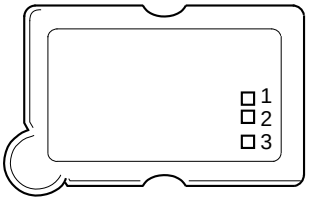
DC OUT (5P FEMALE)



(External view)

Pin No.	Signal	Specifications
1	GND	GND for DC OUT
2	NC	No connection
3	NC	
4	NC	
5	DC OUT	+16.6 to +17.0 V, 2.2 A max

DC OUT (3P)



(External view)

Pin No.	Signal	Specifications
1	BATT (–) OUT	GND for DC OUT
2	BATT (+) OUT	+16.5 to +16.9 V, 2.2 A max
3	RID IN	SENS

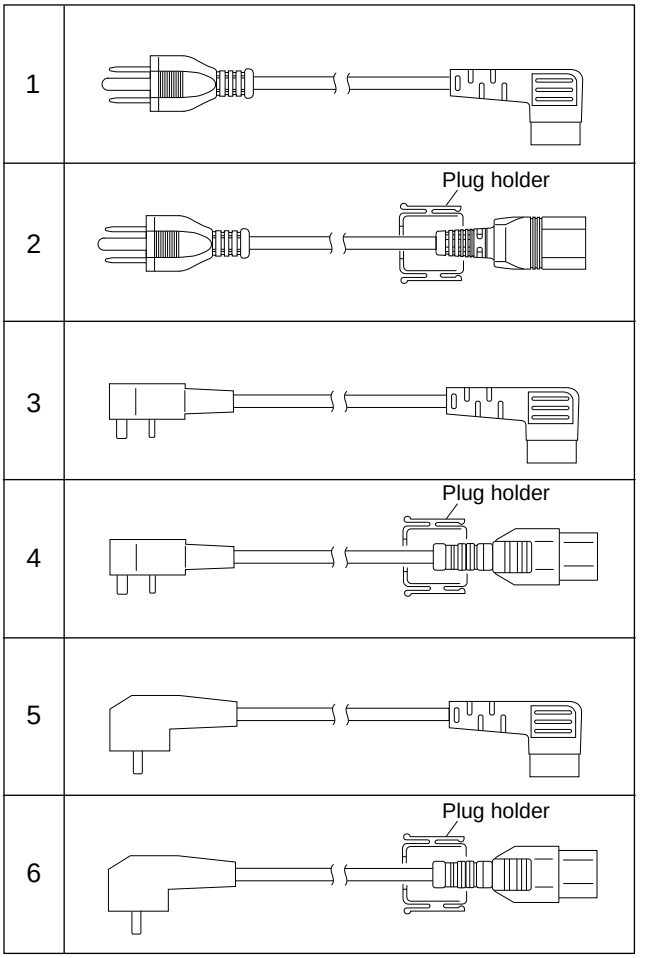
1-2. Connection of Power Cord

1-2-1. Recommended Power Cords

The following power cords are available separately for this unit. Use the power cord that is applicable to the places in the world.

SONY POWER CORD (2.4 m) DK-2401L (Angle type)
DK-2401 (Straight type)

Fig.	Power cord	Rated current	Rated voltage
1	DK-2401L (UC)	7 A	125 V
2	DK-2401 (UC)	10 A	
3	DK-2401L (UK)	7 A	250 V
4	DK-2401 (UK)	10 A	
5	DK-2401L (AE)	10 A	250 V
6	DK-2401 (AE)		



A plug holder supplied with the DK-2401 is not used for the AC-DN1.

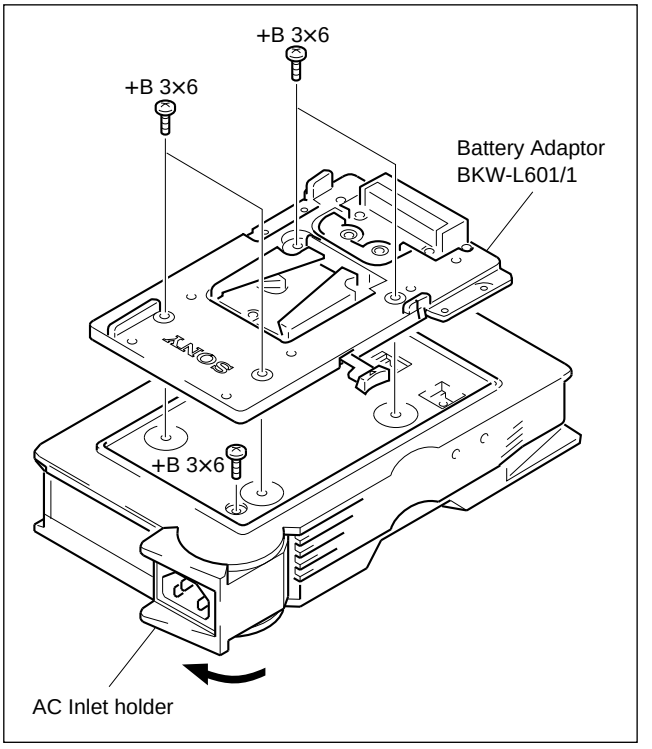
1-2-2. Modification of AC Inlet

Turning the opening of AC inlet up enables a DNE-50 and so on to be AC-operated. At the same time, the battery adaptor BKW-L601/1 should replace the supplied terminal cover. To modify proceed as follows.

Note

Do not turn the AC inlet opening up when using the unit connected to a camcorder outdoors.

1. Remove the four screws securing the battery adaptor BKW-L601/1 (or a terminal cover if installed).
2. Remove the screw and turn the AC inlet holder in the direction of the arrow.
3. Fix the holder with the preceding screw.



4. Make sure that the harness is not damaged and is not caught in the chassis.
5. Attach the terminal cover to the unit with the four screws which were used to secure the battery adaptor.

1-3. Operating Environment

Operating Temperature	: 0 ˚C to +40 ˚C
Storage Temperature	: −5 ˚C to +45 ˚C
Humidity	: No condensation

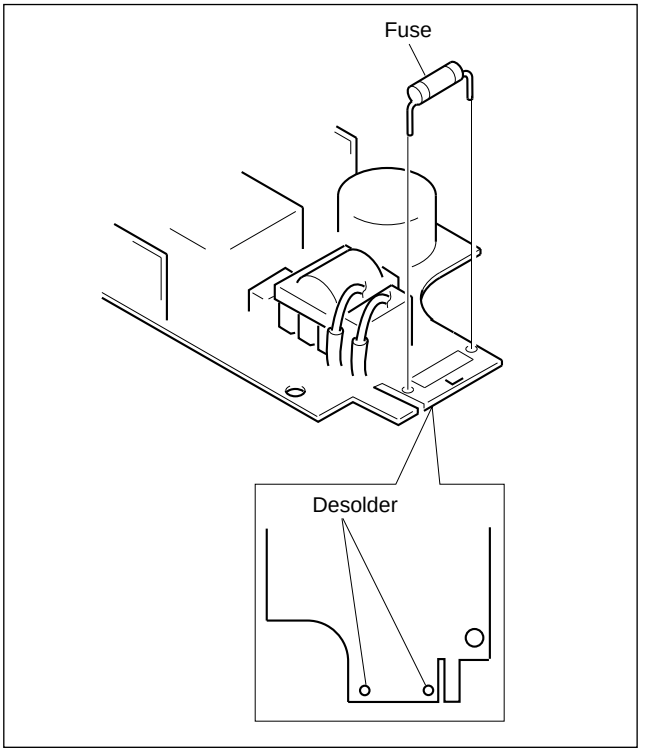
1-4. Replacement of Fuse

WARNING

The fuse is critical to safe operation. Specified parts should be used in the case of replacement.

F1 Sony P/N ⚠9-939-905-01 2 A 250 V

Desolder two pins shown in the figure and replace the fuse with a new one.



1-5. Notes on Spare Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

4. Units Representation

The following represented units are changed or omitted in writing.

	Units	Representation
Capacitance	μF	uF
Inductance	μH	uH
Resistance	Ω	Abbreviation
Temperature	˚C	XXX-DEG-C

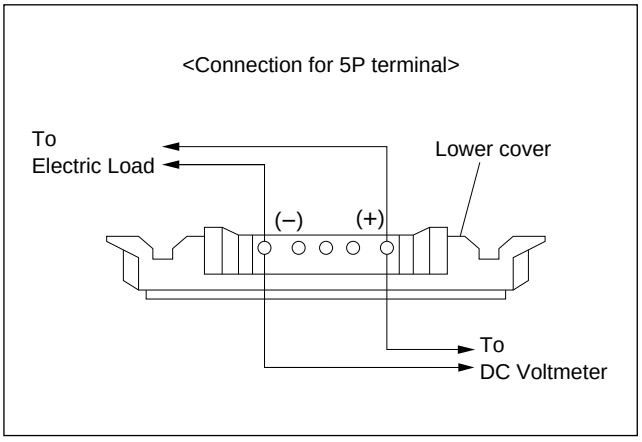
Section 2
Electrical Alignment

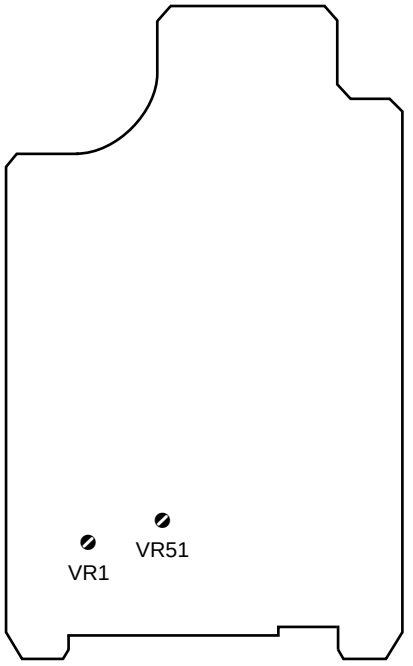
2-1. Preparations

Equipment Required

- Electric Load
  Hewlett-Packard HP6051A + HP60501B or
  Kikusui Electronics PLZ72W or equivalent
- DC Voltmeter

Connection





ED-390 BOARD

2-2. Output Voltage Adjustment

Preparation:

- Set the electric load to 2 A in the constant-current mode.

Test Points: Pins (+), (–)/5P terminal
Adj. Point: ⊘VR51(DC VOLT ADJ)/ED-390 board
Specifications: 16.6 ± 0.1 V

2-3. Limiter Adjustment

Note:

- Make sure that Section 2-2 “Output Voltage Adjustment” has completed.

Preparation:

- Set the electric load to 6 A in the constant-current mode.

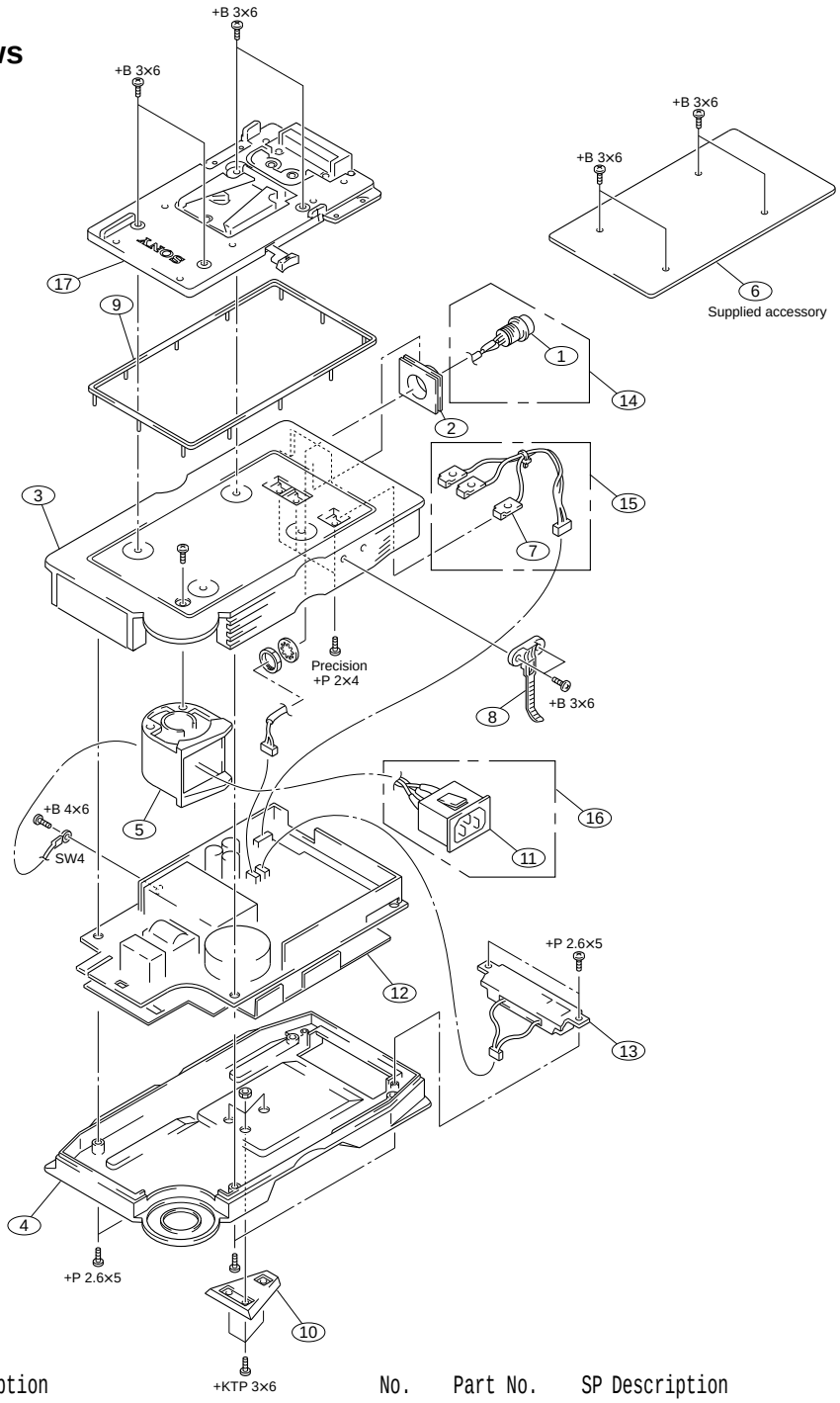
Test Points: Pins (+), (–)/5P terminal
Adj. Point: ⊘VR1(LIMITER)/ED-390 board
Specifications: 11.0 ± 0.1 V

2-4. Note after Adjustment

After these adjustments have completed, be sure to lock ⊘VR1 and ⊘VR51 with paint respectively.

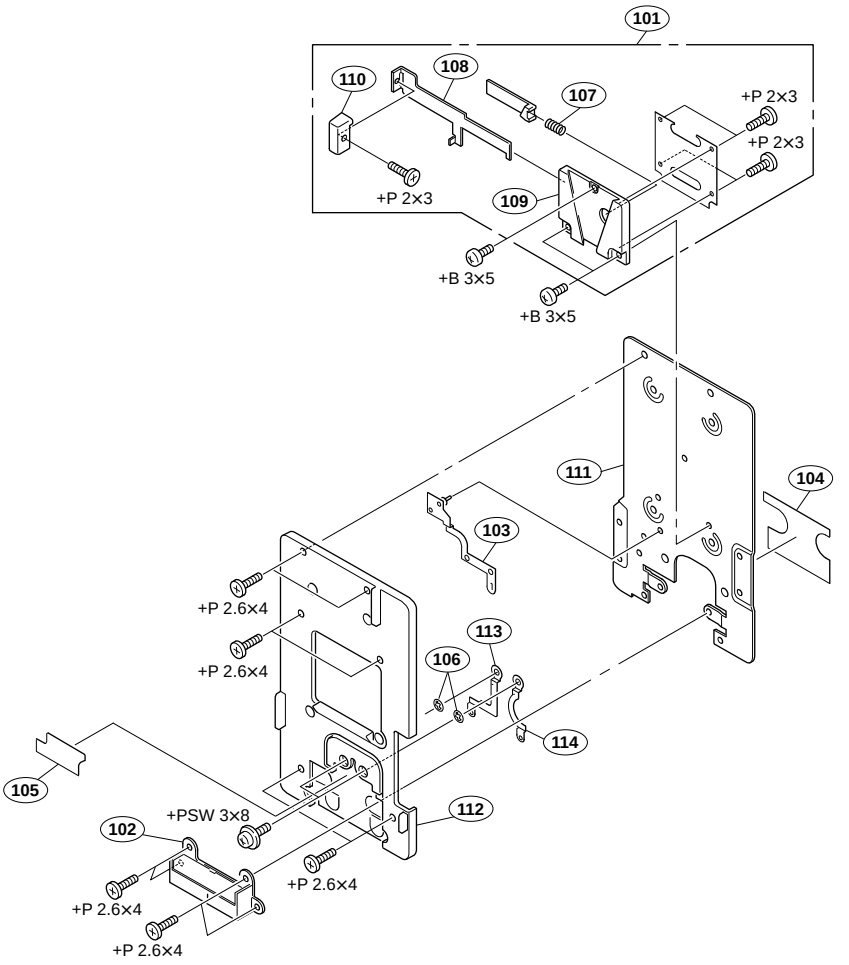
Section 3
Spare Parts

3-1. Exploded Views



No.	Part No.	SP	Description
1	1-565-072-11	s	CONNECTOR, 4P FEMALE “DC OUT”
2	3-192-200-01	o	PANEL, DC OUT
3	3-192-201-01	o	COVER, UPPER
4	3-192-202-01	o	COVER, LOWER
5	3-192-203-01	o	HOLDER
6	3-192-204-01	o	COVER, TERMINAL
7	3-192-206-01	o	PLATE, TERMINAL
8	3-692-186-01	s	HOLDER, CABLE
9	3-718-032-01	s	SHEET, RUBBER, DROP PROTECTION
10	4-628-904-01	s	SHOE, V
11	⚠9-939-758-01	s	AC, INLET
12	9-939-760-01	o	RADIATION, SHEET
13	9-939-763-01	o	HARNESS (W/5P TERMINAL)
14	9-939-764-01	o	HARNESS (W/DC OUT CONNECTOR)
15	9-939-765-01	o	HARNESS (W/3P TERMINAL)
16	⚠9-939-766-01	o	HARNESS (W/AC INLET)
17	----------		BATTERY ADAPTOR BKW-L601/1
	7-621-255-25	s	SCREW +P 2X4
	7-623-210-22	o	SW 4, TYPE 2
	7-682-547-09	s	SCREW +B 3X6
	7-682-560-04	o	SCREW +B 4X6
	7-685-132-19	s	SCREW +P 2.6X5
	7-685-245-19	s	SCREW +KTP 3X6

Battery Adaptor



No.	Part No.	SP	Description
101	A-8278-025-C	s	MOUNT, V ASSY
102	1-766-377-12	s	CONNECTOR, BATTERY
103	3-606-344-01	o	PLATE (ID)
104	3-606-345-01	o	SEAL
105	3-606-346-01	o	SEAL (FRONT)
106	3-669-596-00	s	WASHER (2.3), STOPPER
107	3-679-648-02	o	SPRING, COMPRESSION
108	3-679-688-02	o	LEVER, RELEASE
109	3-679-690-02	o	MOUNT, V
110	3-680-952-01	o	KNOB, RELEASE LEVER
111	3-680-996-02	o	PLATE
112	3-680-997-02	o	INSULATOR
113	3-680-998-02	o	PLATE (+)
114	3-680-999-02	o	PLATE (-)
	7-627-553-38	s	SCREW, PRECISION +P 2X3
	7-627-556-38	s	SCREW +P 2.6X4.0
	7-682-546-09	s	SCREW +B 3X5
	7-682-948-01	s	SCREW +PSW 3X8

3-2. Electrical Parts

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ED-390 BOARD
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Ref.No. or Q'ty	Part No.	SP	Description
C1	⚠9-939-727-01	s	CAP, FILM 0.22 275V
C2	⚠9-939-728-01	s	CAP, FILM 0.047uF
C3	⚠9-939-730-01	s	CAP, FILM 2200PF
C4	⚠9-939-730-01	s	CAP, FILM 2200PF
C5	⚠9-939-730-01	s	CAP, FILM 2200PF
C6	9-939-723-01	s	CAP, ELECT 150uF
C8	9-939-731-01	s	CAP, FILM 100PF
C10	9-939-724-01	s	CAP, ELECT 33uF
C12	9-939-906-01	s	CAP, CERAMIC 2200PF 50V
C13	9-939-732-01	s	CAP, FILM 0.1uF
C52	9-939-725-01	s	CAP, ELECT 470uF 25V
C53	9-939-725-01	s	CAP, ELECT 470uF 25V
C54	9-939-725-01	s	CAP, ELECT 470uF 25V
C55	9-939-726-01	s	CAP, ELECT 330uF 25V
C56	9-939-734-01	s	CAP, FILM 1uF
C59	9-939-732-01	s	CAP, FILM 0.1uF
C60	9-939-732-01	s	CAP, FILM 0.1uF
C61	9-939-729-01	s	CAP, FILM 0.1uF
C62	9-939-724-01	s	CAP, ELECT 33uF
C64	9-939-732-01	s	CAP, FILM 0.1uF
D1	8-719-510-19	s	DIODE D2SBA60
D2	9-939-721-01	s	DIODE SM-1XH06TPA
D3	9-939-721-01	s	DIODE SM-1XH06TPA
D4	9-939-721-01	s	DIODE SM-1XH06TPA
D51	9-939-722-01	s	DIODE SF10LC20U
D52	9-939-721-01	s	DIODE SM-1XH06TPA
D53	8-719-107-94	s	DIODE 1SS202-1
F1	⚠9-939-905-01	s	FUSE 2A 250V
IC1	9-939-717-01	s	IC XC011T
IC51	8-759-140-85	s	IC uPC1093J
IC52	8-759-708-05	s	IC NJM78L05A
IC53	9-939-718-01	s	IC uPC393HA
IC54	8-759-144-17	s	IC uPC358HA
L3	⚠9-939-911-01	s	COIL
L51	9-939-912-01	s	COIL
LED51	8-719-988-04	s	LED GL3KG8
PC1	⚠8-749-924-84	s	PHOTOCOUPLER PS2561L1-1-V-H
Q1	9-939-719-01	s	TRANSISTOR 2SK2333
Q2	8-729-904-29	s	TRANSISTOR 2SC4054
Q51	9-939-720-01	s	TRANSISTOR 2SJ376
Q52	8-729-115-15	s	TRANSISTOR BN1A4M
R1	⚠9-939-738-01	s	RES, CARBON 330K
R2	9-939-907-01	s	RES, CARBON 47K 1W
R3	9-939-907-01	s	RES, CARBON 47K 1W
R4	9-939-749-01	s	RES, METAL 0.22
R5	1-249-425-11	s	RES, CARBON 4.7K
R6	9-939-740-01	s	RES, METAL 22
R7	1-249-406-11	s	RES, CARBON 120
R8	9-939-741-01	s	RES, METAL 47
R9	9-939-903-01	s	RES, CARBON 390 1/4W
R10	1-249-441-11	s	RES, CARBON 100K
R11	9-939-908-01	s	RES, CARBON 2.2 1W
R13	1-249-422-11	s	RES, CARBON 2.7K
R14	1-249-429-11	s	RES, CARBON 10K
R15	9-939-902-01	s	RES, METAL 1M 1W
R52	1-249-420-11	s	RES, CARBON 1.8K
R53	1-247-871-91	s	RES, CARBON 47K
R54	1-247-863-91	s	RES, CARBON 22K
R55	1-247-843-91	s	RES, CARBON 3.3K
R56	1-249-422-11	s	RES, CARBON 2.7K
R58	1-249-421-11	s	RES, CARBON 2.2K
R61	1-247-871-91	s	RES, CARBON 47K
R62	1-249-425-11	s	RES, CARBON 4.7K
R63	9-939-743-01	s	RES, METAL 10K
R64	9-939-909-01	s	RES, CARBON 1K 1W
R65	9-939-745-01	s	RES, METAL 111K
R66	9-939-910-01	s	RES, CARBON 12K 1W
R67	9-939-747-01	s	RES, METAL 6.2K
R70	9-939-743-01	s	RES, METAL 10K
R71	9-939-743-01	s	RES, METAL 10K
R72	9-939-743-01	s	RES, METAL 10K
R73	9-939-743-01	s	RES, METAL 10K
R74	9-939-743-01	s	RES, METAL 10K
R75	9-939-750-01	s	RES, METAL 0.05
R76	9-939-903-01	s	RES, CARBON 390 1/4W
T1	⚠9-939-756-01	s	TRANSFORMER
TF1	⚠9-939-900-01	s	FUSE, THERMAL 2A 250V
TH1	9-939-753-01	s	THERMISTER
TH2	9-939-753-01	s	THERMISTER
TS51	9-939-901-01	s	SWITCH, THERMAL
VR1	9-939-751-01	s	RES, ADJ 100
VR51	9-939-752-01	s	RES, ADJ 2K
ZD1	9-939-898-01	s	ZENER DIODE (30V)
ZD2	9-939-898-01	s	ZENER DIODE (30V)
ZD3	9-939-899-01	s	ZENER DIODE (18V)

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Frame
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Ref.No. or Q'ty	Part No.	SP	Description
1pc	⚠9-939-758-01	s	AC INLET
1pc	9-939-763-01	o	HARNESS (W/5P TERMINAL)
1pc	9-939-764-01	o	HARNESS (W/DC OUT CONNECTOR)
1pc	9-939-765-01	o	HARNESS (W/3P TERMINAL)
1pc	⚠9-939-766-01	o	HARNESS (W/AC INLET)
CN100	1-565-072-11	o	CONNECTOR 4P FEMALE “DC OUT”

3-3. Supplied Accessories

Ref.No. or Q'ty	Part No.	SP	Description
1pc	1-777-899-11	s	CORD, CONNECTION
1pc	3-192-204-01	o	COVER, TERMINAL

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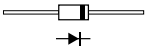
Section 4
Semiconductor Pin Assignments

ここに記載されている半導体は，それぞれの機能を等価的に表したものです。　なお，互換性のない型名を併記していることがありますので，部品を交換するときは，Spare Partsの章を参照してください。
等価回路はＩＣメーカーのデータブックに従いました。

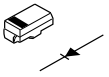
Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

DIODE



1SS202-1
1SS202-1-T1
SM-1XH06TPA

-TOP VIEW-



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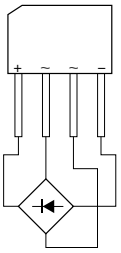

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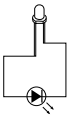
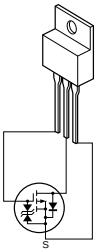


GL3KG8 ;GREEN

TRANSISTOR



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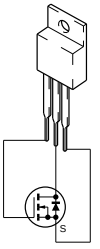

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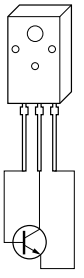

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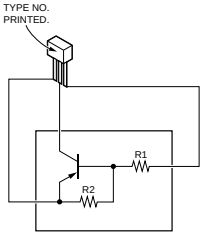
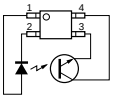


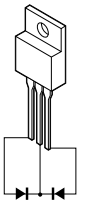
BN1A4M (R1=10K,R2=10K)

OTHERS

-TOP VIEW-



PS2561L1-1-V-H

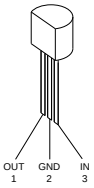


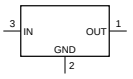
SF10LC20U

IC

NJM78L05A (JRC)+5V(100mA)
UPC78L05J

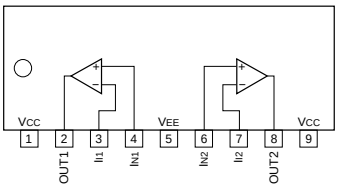
POSITIVE VOLTAGE REGULATOR





UPC393HA (NEC)

DUAL OPERATIONAL AMPLIFER
-SIDE VIEW-

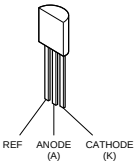


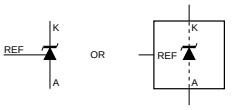
SUPPLY VOLTAGE

TYPE	VCC	VEE
DUAL POWER SUPPLY	+1 to +16V	–1 to –16V
SINGLE POWER SUPPLY	+2 to +32V	GND

UPC1093J (NEC)
UPC1093J-T

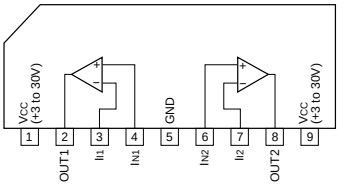
ADJUSTABLE PRECISION SHUNT REGULATOR
-TOP VIEW-





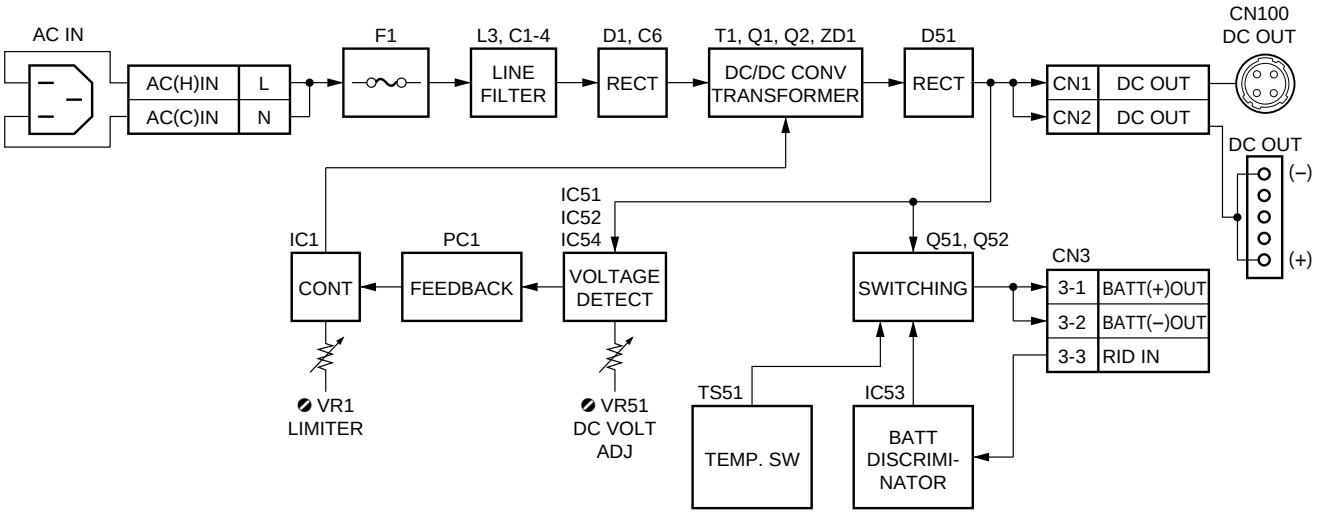
UPC358HA (NEC)

DUAL OPERATIONAL AMPLIFIER
-TOP VIEW-



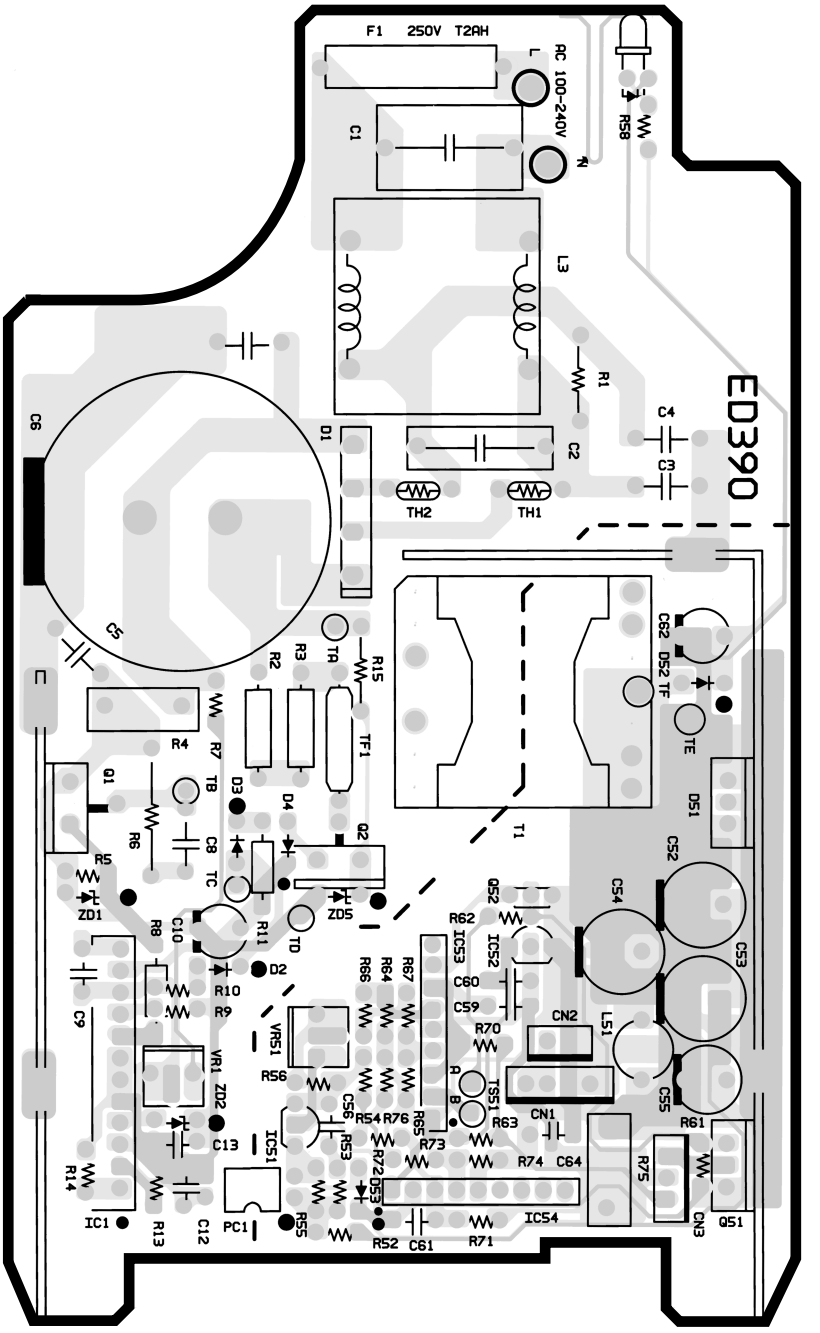
Section 5
Diagrams and Board Layout

5-1. Block Diagram



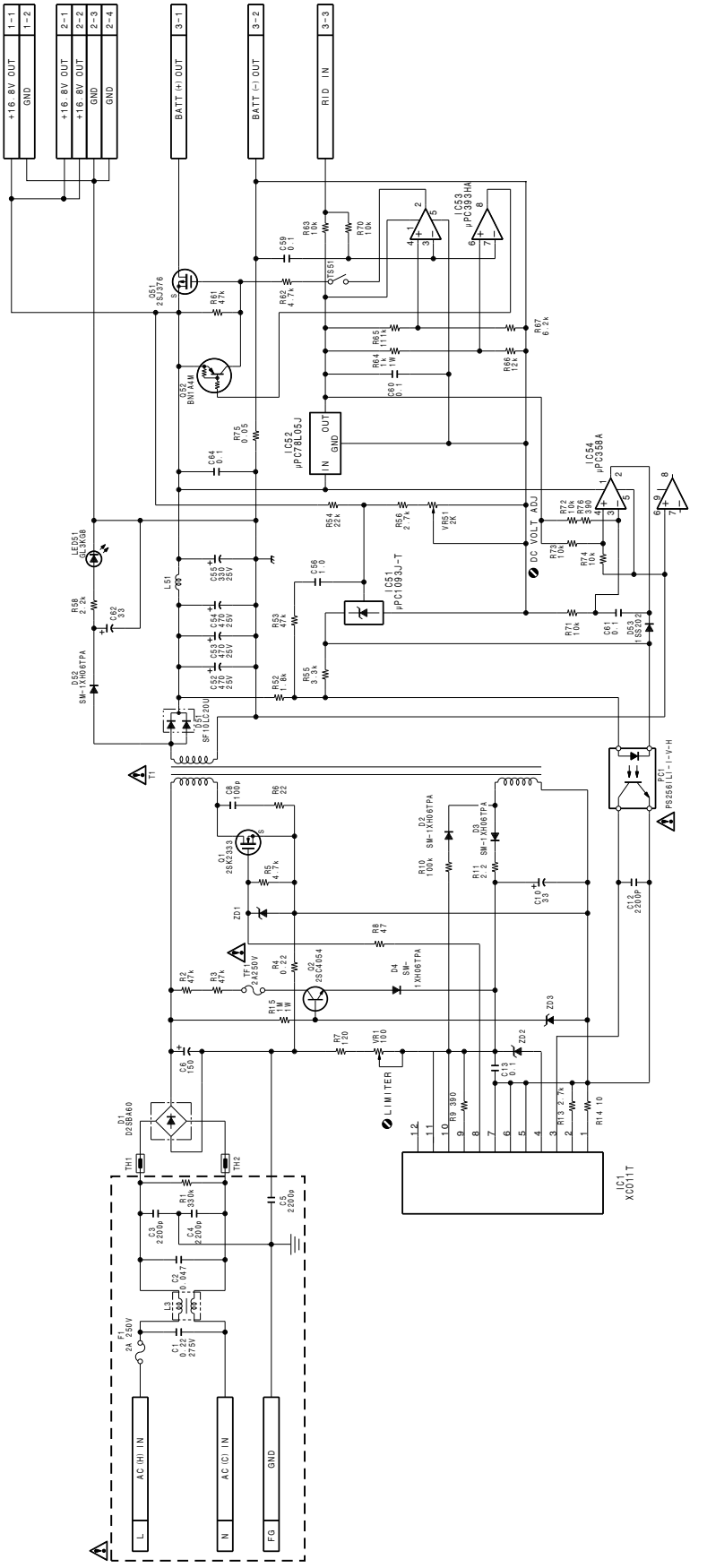
5-2. Board Layout

AC-DN1 :



ED-390 -COMPONENT SIDE-

5-3. Schematic Diagram



ED-390 BOARD
AC-DN1
LOT 605-
B-¥ ACDN1-ED390/M

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

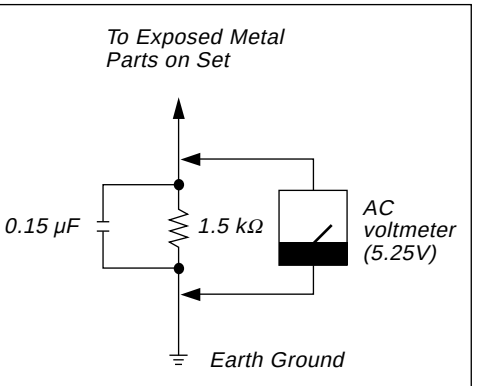

Fig A. Using an AC voltmeter to check AC leakage.

AC-DN1 (SY) J, E
3-191-468-01 (1)

Sony Corporation
Broadcast Products Company

Printed in Japan
1997. 2 16
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Published by Broadcast Products Company